

Experiences in Management of Pott's Paraplegia and Paraparesis in Medical Wards of Usmanu Danfodiyo University Teaching Hospital, Sokoto, Nigeria

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Abstract

Background: Pott's disease refers to spinal tuberculosis, which commonly leads to a gradual onset of neurological deficit that are difficult to diagnose at the early stage.

Method: The study was a combination of retrospective and prospective study. Information was obtained using a predesigned protocol. Diagnosis was based on clinical features and plain spinal x-ray. Anti-tuberculous therapy was instituted in all patients for a minimum of 18 months. Monitoring of neurological status was done weekly.

Results: There were 92 patients made up of 71 males (77.2%) and 21 females (22.8%) with a male: female ratios of 3.4:1. 53.3% were paraplegic while 46.7% were paraparetic. The age group 31-40 years was the most affected. 43.5% of the patients were farmers who formed the majority. Back pain, weight loss, paraplegia and paraparesis in that order were the common clinical features. 25% of the patients recovered full use of their lower limbs at the end of the study. Thoracic spine and lumbar spine were equally involved (41.5% respectively) while thoraco-lumbar spine was involved in 15.1% of patients. Cervical spine was only involved in 1.9% of the patients.

Conclusion: Effective management of spinal tuberculosis should be a teamwork involving the physician, orthopedic surgeon, neurosurgeon as well as the radiologist. The rural populace needs to be educated to prevent late complications and ensure better prognosis.

Key words: Pott's paraparesis, paraplegia, medical management.

Résumé

Contexte: La maladie Pott fait référence à tuberculose spinal qui mène généralement à un début progressif de déficit neurologique qui sont difficile à diagnostiquer dans son étape de commencement.

Méthode : L'étude était une combinaison retrospective et prospective. Les informations sont obtenues en utilisant un protocole préconçu. Le diagnostic est basé sur les traits cliniques et une radiographie spinal simple. La thérapie anti-tuberculose a été instituer chez tous les malades durant 18mois au minimum. Le monitoring de l'état neurologique été fait chaque semaine.

Resultats : Il y avait 92 malades compris de 71 hommes (77.2%) et 21 femmes (22.8%) avec la proportion hommes : femmes de 3.4 :1. 53.3% sont paraplégiques alors que 46.7% sont paraparétiques. La tranche d'âge de 31-40 ans sont les plus affectés. 43.3% des malades sont des fermier qui font la majorité. Les maux aux reins, la maigreur, la paraplégie et la paraparésie, dans cette ordre sont les traits medicales commun. 25% des malades ont recouvré l'usage complet de leurs membres bas à la fin de l'étude. L'épine thoracique et l'épine de dos inférieurs sont également inclus (respectivement 41.5%) tandis que l'épine thoraco de dos inférieurs sont inclus en 15.1% malades. L'épine cervicale était seulement inclus en 1.9% de malades.

Conclusion : La gestion efficace de la tuberculose spinal doit être une collaboration entre le médecine, le chirurgien orthopédiste, le neurochirurgien, aussi que le radiologue. Les paysans doivent être instruit pour empêcher les complication tardive et assurer un bon pronostic.

Mots clés : Le paraparésie, le paraplégie, la gestion medicale

Introduction

Pott's disease is said to occur in about 1-2% of patients with tuberculosis^{1, 2} and accounts for 40-50% of musculoskeletal tuberculosis.^{1, 2} It results from an infection of the bone by Mycobacterium tuberculosis bacteria through a combination of haematogenous route and lymphatic drainage. The organism may stay dormant in the skeletal system for an extended period of time before the disease can be detected. The basic lesion may be a combination of osteomyelitis and arthritis. Spinal cord may become involved in compression by bony elements and/or expanding abscess or by direct involvement of cord and leptomeninges by granulation tissue. Neurological deficit are usually more symmetrical and of more gradual onset than those resulting from other pathologies.³ Typically, more than one vertebra is involved and more than one component of the spine is involved namely the vertebral body, intervertebral disc and the ligaments, paravertebral soft tissues and the epidural space.⁴ The condition most commonly involve the lower thoracic and the thoraco-lumbar spine.⁵

Diagnosing the condition early is difficult due to the reported insidious onset of neurological symptoms and the fact that radiological appearance is diagnostic in less than 50% of cases.⁶ Microbiological confirmation of the diagnosis is possible only by direct analysis of tissue or pus either at operation or from a vertebral biopsy.⁷ Biopsies are also needed for histological confirmation. Akman et al⁶ had stated that magnetic resonance imaging (MRI) is effective in the early diagnosis of tuberculous spondylitis, being able to detect lesion, which may not be apparent on plain radiograph. MRI is not readily available in most hospitals, worse still in a developing country like Nigeria. We are therefore left with the plain radiograph and a high index of suspicion to look out for such a difficult to detect disease in a population that is not enlightened enough to present to hospital until they have developed disabling complications.

This study documents our experiences in the management of complicated tuberculosis (TB) of the spine in Sokoto, North West of Nigeria with emphasis on clinical improvement made within the period of therapy, and to compare findings with other reports.

Materials and Methods

The study was a combination of retrospective and prospective one of all patients that were managed in the medical wards of Usmanu Danfodiyo University Teaching Hospital (UDUTH) with a diagnosis of Pott's paraplegia or paraparesis within the period of January 1995 to December 2004 (a period of ten years). Diagnoses were based on clinical features and typical spinal x-ray features. Information was obtained on both groups using a predesigned protocol. The clinical features accepted for inclusion in the study were the presence of paraparesis or paraplegia in a patient with back pain, fever, weight loss, night

sweat with or without cough and bone deformity. The radiological feature accepted for inclusion were disc space narrowing, kissing lesions, wedge collapse of vertebra, vertebra plana, lesions localized in the vertebral body and/or its appendages, paraspinal abscess, complete destruction of vertebra body⁹ as reported by the radiologists. Patient with HIV positivity were excluded from the study.

The first five years of the study was retrospective while the last five years was prospective. Laboratory data on some of the patients were incomplete due to lack of funds. Other data obtained include; name, sex, age, occupation, tribe, place of residence, date of presentation/admission. All the data obtained were analysed and the results were interpreted and some were displayed in tables and graph.

All the patients received the following anti-tuberculosis drugs for eighteen months or longer; Capsules of Rifampicin 600mg daily, Tablets Isoniazid 300mg daily, and Tablets Pyrazinamide 1.5g daily. Tablets of Pyridoxine 25mg daily was given for the same length of time to counter the neurological side effect of isoniazid while Tablets of Ethambutol 800mg daily was given for the first sixty days. The only exceptions to completed therapy were those lost to follow-up, or those that died or left against medical advice.

Only one patient was put on plaster jacket with traction for six weeks. Monitoring of neurological status was done weekly. When grade of power was observed to be three and above, patients were sent for physiotherapy where walking re-education was instituted. Discharged patients were followed up at the outpatient departments until they completed their treatment or were lost to follow up.

Results

Ninety-two patients made up of 71 males (77.2%) and 21 females (22.8%) satisfied the criteria for inclusion in the study (Male: Female = 3.4:1) Fifty-nine (53.3%) were paraplegics while 43 (46.7%) were paraparetic. Table 1 shows the age and sex distribution of the patients studied. Those between the ages of 15 to 20 years were the least affected while the rest were more or less evenly distributed in all the age groups. Majority of the patients were seen between the year 2000 and 2004. There were no patients in 1998. Majority of the patients were farmers who constituted 43.5% of all the patients. Artisans were the least involved (Table 2). Table 3 shows the clinical feature the patients presented with. Back pain was the most common feature followed by weight loss, paraplegia and paraparesis in that order. Forty patients were followed up for more than twelve months. Among these, thirty patients were closely monitored in the first twelve weeks of therapy. Six were able to walk unaided within this period while eleven others were able to walk with crutches. Thirteen others had power between grades 1 and 2. After two weeks of therapy, grade one power was noted in 4 patients who were admitted with grade zero

power. The earliest change from grade 1 power to grade 3 power was after four weeks of therapy. After a further two weeks, this patient was able to walk with crutches. The earliest change from grade 1 power to grade 4 power was eight weeks in one patient. Most of the others that walked unaided were after twelve weeks of therapy. There were still others who took twelve weeks before they were able to walk with crutches. Some of them continued to make steady progress until they were able to walk unaided. Most of those who did not show any neurological improvement after six months of therapy failed to show any further neurological improvement. At the end of the period of follow up, 23 of the 92 patients (25%) recovered full use of their lower limbs. This included the one patient who was on plaster jacket with traction. Nine others (9.8%) recovered partially. There was no definite recovery in another 10 patients. No group of vertebra conferred any advantage with

regard to recovery. The recovery status of 50 patients was not documented as they left the study before conclusion or were discharged on request.

Spinal X-ray reports of 53 patients were available. Cervical spine was involved in 1 patient (1.9%) thoracic spine in 22 patients (41.5%) Lumbar spine was involved in 22 patients (41.5%) and thoracolumbar spine was involved in 8 patients (15.1%). Laboratory data was not available in all the patients. 15 patients had a packed cell volume (PCV) of less than 30%. In 50 patients PCV was more than or equal to 30%. ESR was raised above 50mm in 1 hr in 27 patients. Fifty-two patients had WBC count higher than $3.0 \times 10^9/l$. Mantoux test was more than 12mm in 32 patients.

Eight patients (8.7%) died in hospital. Fifty-six patients (60.9%) survived, 28 (30.4%) signed against medical advice and left at different stages of illness.

Table 1: Age and sex distribution of 92 patients with Pott's paraplegia and paraparesis

Age	Male	Female	Total	%
15-20	3	5	8	8.7
21-30	13	3	16	17.4
31-40	14	5	19	20.7
41-50	14	3	17	18.5
51-60	11	3	14	15.2
61	16	2	18	19.6
Total (%)	71 (77.2)	21 (22.8)	92	100

Table 2: Occupation of 92 patients with Pott's paraplegia and paraparesis

Occupation	No.	%
Civil servants	10	10.9
Unemployed	3	3.3
Drivers	3	3.3
Artisans	2	2.2
House wives	20	21.7
Farmers	40	43.5
Students	9	9.8
Businessmen	5	5.4
Total	92	100

Table 3: Clinical features of Pott's paraplegia and paraparesis in 92 patients

Clinical features	No. (n = 92)	%
Back pain	71	77.2
Paraparesis	43	46.7
Paraplegia	49	53.3
Fever	34	37
Weight loss	52	56.5
Cough	31	33.7
Night sweats	30	32.6
Incontinence	16	17.4
Bed sore	7	7.6
Cold abscess	11	12
Bone deformity	19	20.7

Discussion

There were ninety-two patients included in the study. This is the highest collection of patients with complicated spinal tuberculosis studied over the same period⁹ or even over a longer period of time¹¹ in Nigeria. Other earlier studies, though much concerned about the radiological features, still had fewer patients.^{8, 11} The males predominated in this study. This is in agreement with the findings in some earlier studies^{8, 12-14} but at variance with others.^{9, 10} 53.3% of the patients were paraplegic while 46.7% were paraparetic. This large number of paraplegic and paraparetic patients seen in our study may derive from the low level of education and health care in our catchments area. Patients wait until they can no longer cope with their daily activities before they present to hospital.

The younger age groups were the least affected in our study. This is at variance with the findings of Ikem et al¹¹ and Solagberu et al.⁹ Our patients were evenly spread over the adult age group. We did not however consider those in the paediatric age group like in their study. Farmers contributed an overwhelming majority among our patients making up 43.5% of all the patients. They were followed by house wives (21.7%). Students only constituted 9.8% of the patients. It is noteworthy that these farmers and housewives come from the low social class living in rural areas where the first instinct with occurrence of

any illness is usually to see the native doctor whose methods tends to worsen rather than improve the neurological deficits. The patients in the study by Ikem et al were not confined to the low socio-economic class. Civil servants and businessmen in our study constituted 10.9% and 5.4% respectively.

Back pain was the commonest presenting feature in agreement with findings in earlier studies.^{10, 11} Paraplegia and inability to walk was found in 40% and 46% of the patients of Obajimi et al¹ while paralysis and paraparesis were found in 5.97% and 47.1% of the patients of Ikem et al.¹⁰ 53.3% of our patients were paraplegic while 46.7% were paraparetic. On the whole severe motor affection of the lower limb is a serious complication of spinal tuberculosis in third world countries where diagnosis of the disease is delayed due to ignorance on the side of the patients, lack of the appropriate equipment to make early diagnosis and the insidious nature of the onset of the disease.⁶

Watching the rate of recovery of motor function in the lower limbs engaged our attention for twelve weeks. Except one patient on plaster jacket and traction all others received medical treatment only. Recovery of neurological function was as reported in the result section. These patients are long stay patients. The improvement in neurological function was observed not to be age dependent as some elderly patients improved faster than their young counterparts. The one patient on plaster jacket did not recover faster than those on medical therapy only. There were still others who did not show any sign of improvement. We were not able to site any literature that assessed the rate of recovery on therapy.

With regards to recovery of motor function, the patients of Ikem et al¹⁰ fared better with 79.4% having no neurological deficits and 8.9% mobilized on crutches. Only 25% of our patients recovered full use of the lower limbs with an additional 9.8% mobilized on crutches; 10.9% of our patients were confined to the wheel chair compared to 5.9% in their series. However, the patients in the study by Ikem et al came from an educationally well-developed area where people tend to present early to clinic thus ensuring a better clinical outcome.

The frequencies of affection of the thoracic and lumbar spines were equal in this study. Other studies have found the thoracic spine predominantly affected,^{1, 13} while others have found the lumbar spine to be more affected.^{9, 10} The thoraco-lumbar spine has maintained a third place in all, including this study.

Medical therapy has been advocated even when surgical intervention becomes necessary.² In this study, we used combination chemotherapy starting with four drugs and continuing with three over a long period of time. Only 8.7% of the patients died from different complications of chronic ill health that result from long stay in bed. 30.4% signed against medical advice and left the hospital, some for lack of funds, others for lack of progress and yet others for different reasons.

In conclusion, management of spinal tuberculosis

requires the cooperation of the physician, radiologist, orthopaedic surgeon and neurosurgeon working as a team to ensure early diagnosis, chemotherapy and surgical intervention when indicated as long as the manpower and equipment needed are available. Chemotherapy should never be neglected when teamwork is not possible. Health education especially of the rural populace should be increased to ensure that patients present early and drug therapy should be free or at worst subsidized to save people from this disabling disease.

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